

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

# PCT

To:

see form PCT/ISA/220



WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY  
(PCT Rule 43bis.1)

Date of mailing  
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference  
see form PCT/ISA/220

**FOR FURTHER ACTION**  
See paragraph 2 below

International application No.  
PCT/JP2004/001514

International filing date (day/month/year)  
12.02.2004

Priority date (day/month/year)  
14.02.2003

International Patent Classification (IPC) or both national classification and IPC  
C07F9/50, C07F15/00, C07C23/04, C07B37/00

Applicant  
TAKASAGO INTERNATIONAL CORPORATION

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

## 2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
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**Box No. I Basis of the opinion**

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1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.  
☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material:  
☐ a sequence listing  
☐ table(s) related to the sequence listing
  - b. format of material:  
☐ in written format  
☐ in computer readable form
  - c. time of filing/furnishing:  
☐ contained in the international application as filed.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

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PCT/JP2004/001514

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**Box No. II Priority**

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1. ☒ The following document has not been furnished:

- ☒ copy of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(a)).
- ☐ translation of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. Additional observations, if necessary:

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**Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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1. Statement

Novelty (N)	Yes: Claims	1-10
	No: Claims	11
Inventive step (IS)	Yes: Claims	1-10
	No: Claims	11
Industrial applicability (IA)	Yes: Claims	1-11
	No: Claims	

2. Citations and explanations

**see separate sheet**

**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

I) Reference is made to the following documents:

- D1:TOPOLSKI, M. ET AL., JOURNAL OF ORGANIC CHEMISTRY (1993), 58(3), 546-55, 1993  
D2:WALBORSKY, H. M. ET AL., TETRAHEDRON LETTERS (1985), 26(23), 2743-6, 1985  
D3:BOCHE, G. ET AL., JOURNAL OF THE AMERICAN CHEMICAL SOCIETY (1980), 102(17), 5697-9, 1980  
D4:LUCKENBACH, REINER ET AL., ZEITSCHRIFT FUER NATURFORSCHUNG, TEIL B: ANORGANISCHE CHEMIE, ORGANISCHE CHEMIE (1979), 34B(3), 464-80, 1979  
D5:SANDER, VOLKER ET AL., CHEMISCHE BERICHTE (1978), 111(12), 3879-91, 1978  
D6:WALBORSKY, H. M. ET AL., JOURNAL OF ORGANOMETALLIC CHEMISTRY (1973), 51, 55-75, 1973  
D7:WALBORSKY, H. M. ET AL., JOURNAL OF ORGANOMETALLIC CHEMISTRY (1973), 51, 31-53, 1973  
D8:WALBORSKY, HARRY M. ET AL., JOURNAL OF THE AMERICAN CHEMICAL SOCIETY (1971), 93(3), 671-5, 1971  
D9:HAUSSER, JACK W. ET AL., JOURNAL OF THE AMERICAN CHEMICAL SOCIETY (1967), 89(26), 6981-4, 1967

**NOVELTY:**

YES: Claims 1-10

The available prior art documents do not disclose compounds of formula (1), nor palladium complexes of these phosphine compounds. Consequently novelty is established for claims 1-3. As the palladium complexes are considered to be novel, so is their use as claimed in claims 4-10.

The subject-matter of claims 1-10 is therefore new (Article 33(2) PCT).

NO: Claim 11

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 11 is not new in the sense of Article 33(2) PCT.

As a matter of fact, documents D1-D9 all disclose one or more compounds falling within the scope of claim 11.

**INVENTIVE STEP:**

YES: Claims 1-10

The present application relates to phosphine compounds (claim 1), palladium complexes of these phosphine compounds (claims 2 and 3), and the use of these palladium complexes as catalyst in organic synthesis (claims 4-10)

Palladium complexes are known as catalysts in organic synthetic reactions (see "Background Art" on page 1 of the description).

The objective problem underlying the present invention could thus be seen as the provision of further palladium-phosphine compounds, useful as catalyst in organic synthetic reactions.

The solution to this problem proposed in claims 2 and 3 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons:

The presently claimed palladium complexes are chemically and structurally remote from prior art complexes, and are therefore considered to be non-obvious alternatives to these compounds.

As the phosphine compounds are chemically and structurally remote from prior art phosphine compounds, they are considered to be inventive too.

The use of the inventive complexes as claimed in claims 4-10 is also considered to involve an inventive step.

NO: Claim 11

As the subject matter of claim 11 is not novel (vide supra), no inventive step can be recognized for the compounds of claim 11.